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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/963,480	09/27/2001	Kaoru Awaka	TI-33253 (032350.B345)	8718

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EXAMINER

DO, CHAT C

ART UNIT	PAPER NUMBER
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2193

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/963,480

Applicant(s)

AWAKA ET AL.

Examiner

Chat C. Do

Art Unit

2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 February 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 3, 10, 12, 19 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 10, 19 and 20 is/are rejected.
- 7) ☒ Claim(s) 3 and 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. This communication is responsive to Amendment filed 02/01/2007.
2. Claims 1, 3, 10, 12, and 19-20 are pending in this application. Claims 1, 10, and 19-20 are independent claims. In Amendment, claims 2, 4-9, 11, and 13-18 are cancelled. This Office Action is made final.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 10, and 19-20 are rejected under 35 U.S.C. 103(a) as being obvious over Hansen et al. (U.S. Publication 2003/01110197 A1) in view of Itoh (U.S. Publication 2001/0009012 A1).

Re claim 1, Hansen et al. disclose in Figure 2 a multiply-accumulate module (e.g. Figure 2 with 212 ACC as accumulator) comprising: a multiply-accumulate core (e.g. Figure 2), wherein multiply-accumulate core (e.g. Figure 2) comprises: a plurality of Booth encoder cells (e.g. Figure 3 and page 3 right column paragraph 0043); a plurality of Booth decoder (e.g. 201 Figure 2) cells connected to at least encoder cells (e.g. 303 in Figure 3); a plurality of Wallace tree cells (e.g. paragraph 0059 and 202-211 in Figure 2)

connected to at least one of Booth decoder cells; wherein multiply-accumulate module includes a plurality of electrical paths which further include at least one critical path (e.g. any path in Figure 2 would be a critical path as reason under 112 rejection above), the at least one critical path being an electrical path for which an amount of time that it takes for an electrical signal travel from an input of multiply-accumulate core to an output of multiply-accumulate core is greater than or equal to a predetermined amount of time and less than a longest amount of time that it takes any other electrical signal to travel from input of multiply-accumulate core signal to travel from input of multiply-accumulate core to output of multiply-accumulate core, wherein predetermined amount of time is less than a longest amount of time (e.g. translate into mathematical term $t_{pre} < t_{cri} < t_{lon}$ wherein t_{pre} is the predetermined time, t_{cri} is the critical time, and t_{lon} is the longest time; t_{cri} is the path to generate the first output, t_{lon} is the path to generate the last output, t_{pre} is any arbitrary number less than t_{cri}); plurality of Booth decoder cells including at least one first Booth decoder cell and at least one of second Booth decoder cell, each of at least one first Booth decoder cell structurally the same as at least one second Booth decoder cells (e.g. page 3 right column paragraph 0042 wherein structural of decoder cell is same) except that at least one of a first plurality of transistors of first Booth decoder cell is greater than a width of a corresponding one of a second plurality of transistors of second Booth decoder cell (e.g. it is impossible to manufacture all transistors with exact same width); plurality of Wallace tree cells including at least one first Wallace tree cell and at least one second Wallace tree cell, each of at least one first Wallace tree cell structurally the same as each of at least one second Wallace tree cell (e.g. 204 and 207 in Figure 2 wherein the

structural is same) except that at least one of a first plurality of transistors of first Wallace tree cell is greater than a width of a corresponding one of a second plurality of transistors of second Wallace tree cell (e.g. it is impossible to manufacture all transistors with exact same width); wherein at least one first Wallace tree cell and at least one first Booth decoder cell are disposed on at least one critical path (e.g. the critical path running through 4-2 add in Figure 2); and wherein at least one second Wallace tree cell and at least one second Booth decoder cell are disposed on an electrical path not at least one critical path and are not disposed on any of at least one critical path (e.g. the mux would route through at least one Wallace cell).

Hansen et al. fail to disclose at least one of the first Booth decoder cell as transistor is constructed to have a width greater than a width of a corresponding transistor of second Booth decoder cell as transistor. However, Itoh explicitly discloses at least one of the first Booth decoder cell as transistor is constructed to have a width greater than a width of a corresponding transistor of second Booth decoder cell as transistor (e.g. paragraph [0036] and [0042]).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add at least one of the first Booth decoder cell as transistor is constructed to have a width greater than a width of a corresponding transistor of second Booth decoder cell as transistor as seen in Itoh's invention into Hansen's invention because it would enable to increase to generate output at high speed (e.g. paragraph [0036] as more power consumes to generate high speed output).

Re claim 10, it is a parallel multiplier with limitations cited in claim 1. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 19, it is a method claim of claim 1. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 20, it is a method claim of claim 10. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Allowable Subject Matter

5. Claims 3 and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

6. Applicant's arguments with respect to claims 1, 10, and 19-20 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Art Unit: 2193

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

MENG-AI AN
SUPERVISORY PATENT EXAMINER
ELECTRONIC BUSINESS CENTER 2100